

1

**BRaille CELL AND DISPLAY
COMPRISING A PLURALITY OF BRaille
CELLS, AS WELL AS A METHOD FOR
CONTROLLING A PLURALITY OF PINS OF
A BRaille CELL**

The invention relates to a braille cell comprising a frame, a touch board and a plurality of touch pins, each touch pin being enclosed in a cavity in the touch board in such a manner that it can be displaced from a low position, in which the touch pin does not project above the touch surface of the touch board, to a high position, in which the touch pin projects above the touch board by a specific, desired length, and in which frame there is arranged a displacement member, which displacement member can be moved into a desired position under the influence of displacement means, with the result that, depending on the position of the displacement member, a touch pin which is enclosed in a cavity in a touch board may or may not be moved into the high position, in which it projects above the surface of the touch board, as well as to a method for controlling a plurality of touch pins of a braille cell.

Braille cells of the type described above are known, inter alia, from American U.S. Pat. No. 4,283,178. A braille cell of this kind can be used to make a braille symbol which can be detected by the visually handicapped using their fingers. By placing a plurality of braille cells in succession, it is possible to form a number of words. By using braille cells of this kind in combination with, for example, a computer terminal, it is possible for the visually handicapped to perceive the information from the computer.

However, the known braille cells have a number of drawbacks. The braille cells, which are provided with many piezoelectric bending elements, are expensive to produce. Moreover, it is important for the braille symbols to be of a fixed size, so that the correct meaning can be worked out by the visually handicapped. Also, the structure and shape of the braille cells known to date mean that it is only possible to form a single reading line, so that often it is only possible to display parts of sentences, and not complete passages of text. Moreover, braille cells of this kind have to be cleaned regularly, since dirt from the fingers penetrates into and around the pins in the small holes in which the pins move up and down. Since there are numerous electronic components in the vicinity of this pin, cleaning the braille cells is a very labour-intensive operation. Moreover, the lengths of the various touch pins in a braille cell are different, with the result that a plurality of different components are required when assembling the braille cells, resulting in extra costs.

The object of the invention is to provide a braille cell which can be produced at low cost and is formed in such a way that a large number of braille characters can be placed next to and above one another, so that a braille reading board composed of a plurality of lines can be assembled, and preferably a display.

This object is achieved with a braille cell of the type described in the preamble by the fact that the pressure-exerting member is a member, for example in the form of a bar or leaf spring, of which one end can be displaced, with the aid of first displacement means, in a direction perpendicular to the longitudinal direction, it then being possible to place the one end of the bar-like member in a first or a second position, in which case in one of the two positions the pressure-exerting member cannot place the specific touch pin in the high position and in the other position the pressure-exerting member can place the specific touch pin in the high position, and it being possible for second displace-

2

ment means to displace the end of the pressure-exerting member, after the end has adopted one of the two possible positions, in the longitudinal direction, in such a manner that a touch pin is placed or is not placed in the high position.

5 This measure allows a touch pin to be fixed in the correct position with respect to the touch surface of the touch board in a very simple manner.

In a preferred embodiment of the braille cell according to the invention, the first displacement means comprise a plurality of first displacement members, it being possible for each first displacement member to displace the end of a plurality of pressure-exerting members, and a retention member is arranged in the frame close to each touch pin, which retention member serves to hold the end of the pressure-exerting member, after the latter has been displaced over a specific distance in the longitudinal direction with the aid of the second displacement means, in the desired first or second position. This measure makes it possible to produce a very compact braille cell.

In one embodiment of the Braille cell described above, each first displacement member may be configured to be displaceable by either piezoelectricity or magnetic forces. Also, the second displacement means may be a camshaft.

In another possible preferred embodiment according to the invention, a plurality of braille cells are combined to form a display in such a manner that the display comprises a touch board, in which a plurality of groups of touch pins are arranged, it being possible for each group of touch pins to form a braille symbol.

This measure allows all the pressure-exerting members of the various braille symbols to be placed in the desired position very quickly and then allows all the braille symbols to be formed simultaneously and made tangible to a visually handicapped person.

Preferably, the method for controlling a plurality of touch pins of a braille cell is such that the end of a first pressure-exerting member is placed in a desired first position or a second position with the aid of first displacement means, so that the end of a first pressure-exerting member can interact with a member, preferably a wedge-shaped member, and such that the first pressure-exerting member is then displaced in the longitudinal direction, with the aid of second displacement means, over a distance which is such that the end is placed on one side or the other of the wedge-shaped member, depending on the first or the second position, after which the first pressure-exerting member is displaced further in the longitudinal direction, so that the end of the first pressure-exerting member, depending on the location with respect to the wedge, is able or is unable to displace a touch pin and retain it in a desired position. A device which operates in accordance with the method according to the invention has the advantage that the first displacement means can control a plurality of pressure-exerting members; as a result, it is also possible to produce a braille cell, as well as a display which is composed of a plurality of braille cells next to one another, more cheaply and in a more compact form.

Adding the following method to this method, namely in that after a first pressure-exerting member has been placed in a desired position with the aid of the first displacement means, the same first displacement means are then used to place a second pressure-exerting member in a desired first position or a second position, so that the end of the second pressure-exerting member can interact with a second member, preferably a wedge-shaped member, in that the second pressure-exerting member is then displaced in the longitudinal direction, with the aid of second displacement